Claims

1. A combustion engine comprising,

a pair of opposed cylinder elements having a common axis, each cylinder element being provided with a piston reciprocable between first and second locations in the cylinder element the first and second locations respectively representing compression and expansion elements of the piston stroke, each piston having a forward side and a rear side,

a combustion chamber for each cylinder element comprising the forward side of the piston and the walls of the cylinder element,

combustible gas compression means for each combustion chamber,

supply passage means arranged to deliver combustible gas to each combustion gas compression means,

an induction chamber for each piston arranged to receive compressed combustible gas from the combustible gas compression means,

transfer passage means for directing compressed gas from each induction chamber to the respective combustion chamber, and

cam means rotatable about the common axis the cam means being located between the pistons and being connected to each of the pistons for converting the reciprocating motion of the pistons into rotary motion of the cam means,

wherein the arrangement is such that expansion stroke movement of each piston results in a corresponding compression stroke for the compression means and the pistons are coupled so that an expansion stroke of one of the pistons drives the compression stroke of the other of the pistons.

2. A combustion engine according to claim 1 wherein the cam means comprises a cam track encircling a drive shaft aligned with the common axis, and cam follower means connected to the pistons are arranged to follow the cam track whereby to convert the reciprocating motion of the pistons into rotary motion of the drive shaft.

3. A combustion engine according to claim 2 wherein the cam track comprises a groove formed in the drive shaft.

4. A combustion engine according to claim 1 comprising a bore assembly extending through each piston and in line with the axis of each piston and the transfer passage means extend within the bore, the transfer passage means including a transfer port for each piston arranged to communicate with the combustion chamber comprising the forward side of each piston, when each piston is at or near the second location.

5. A combustion engine according to claim 4 including valve means operable by rotation of the cam means to close the transfer port during exhaustion of combusted gases from the combustion chamber and to open the transfer port after exhaustion of combusted gases from the combustion chamber.

6. A combustion engine according to claim 1 comprising an exhaust passage communicating with the combustion chamber when the piston is at or near the second location, the piston being arranged to close off the exhaust passage when it moves to the first location.

7. A combustion engine according to claim 1 comprising,

an intermediate assembly extending between the pistons and connecting the rear side of each piston the intermediate assembly being slidable reciprocably along a centre housing surrounding the cam means, and

the combustible gas compression means comprise,

a first induction/compression chamber for each piston between an end of the intermediate assembly and a piston sealing member, and

a second induction/compression chamber for each piston between the forward side of the piston and the piston sealing member.

8. A combustion engine according to claim 7 comprising,

intermediate ducting means for allowing communication between the first induction/compression chamber of one piston and the induction/compression chamber of the other piston.

9. A combustion engine according to claim 1 wherein the supply passage means comprise,

a supply duct communicating with each induction/compression chamber, and

valve means for allowing combustible gas to be sucked through the supply duct into the respective induction/compression chamber during an expansion stroke of the piston arranged to receive combustible gas from that induction/compression chamber.

10. A combustion engine according to claim 4 wherein the drive shaft extends into both bore assemblies and through a head for at least one of the combustion chambers.

11. A combustion engine according to claim 10 comprising a head for each combustion compression chamber, the drive shaft extending through each head.

12. A combustion engine according to claim 7 wherein the combined volume of each pair of the first and second induction compression chambers is greater than the volume of each of the combustion chambers.

13. A combustion chamber according to claim 12 wherein the combined volume is at least 1.2 times the volume of each of the combustion chambers.